Placental expression of vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 correlates with severity of clinical preeclampsia and villous hypermaturity.

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Public Summary:
Overexpression of soluble vascular endothelial growth factor receptor-1 has been linked to preeclampsia and is thought to be secondary to placental insufficiency caused by hypoxia. Villous hypermaturity, characterized by presence of increased syncytial knots, has been associated with syndromes of placental insufficiency, particularly when severe. This study was undertaken to determine whether there is a link between soluble vascular endothelial growth factor receptor-1 expression, villous hypermaturity, and clinical severity of preeclampsia. We conducted a retrospective cohort study in which 48 placentas were selected from pathology archives (hypertensive group). Of these, 6 had chronic hypertension, 15 had mild preeclampsia, 14 had severe preeclampsia, and 13 had hemolysis, elevated liver enzymes, and low platelets syndrome. These were compared with 55 placentas from normotensive patients (control group). One representative section of placental parenchyma from each case was stained with an antibody to vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 and given a score based on extent and intensity of staining, representing expression level. Assignment of staining score was done, blinded to clinical history and pathologic diagnosis. Vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 staining was seen in placental syncytiotrophoblasts and was particularly strong in syncytial knots. There was a positive association between vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 staining score and severity of clinical hypertensive state, small placental size, and villous hypermaturity. The association between vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 score and small placentas did not persist after controlling for hypermaturity. Vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 overexpression in the placenta strongly correlates with both severity of hypertensive disease and villous hypermaturity. The correlation with villous hypermaturity further links hypoxia to vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 production in the placenta.

Scientific Abstract:
Overexpression of soluble vascular endothelial growth factor receptor-1 has been linked to preeclampsia and is thought to be secondary to placental insufficiency caused by hypoxia. Villous hypermaturity, characterized by presence of increased syncytial knots, has been associated with syndromes of placental insufficiency, particularly when severe. This study was undertaken to determine whether there is a link between soluble vascular endothelial growth factor receptor-1 expression, villous hypermaturity, and clinical severity of preeclampsia. We conducted a retrospective cohort study in which 48 placentas were selected from pathology archives (hypertensive group). Of these, 6 had chronic hypertension, 15 had mild preeclampsia, 14 had severe preeclampsia, and 13 had hemolysis, elevated liver enzymes, and low platelets syndrome. These were compared with 55 placentas from normotensive patients (control group). One representative section of placental parenchyma from each case was stained with an antibody to vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 and given a score based on extent and intensity of staining, representing expression level. Assignment of staining score was done, blinded to clinical history and pathologic diagnosis. Vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 staining was seen in placental syncytiotrophoblasts and was particularly strong in syncytial knots. There was a positive association between vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 staining score and severity of clinical hypertensive state, small placental size, and villous hypermaturity. The association between vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 score and small placentas did not persist after controlling for hypermaturity. Vascular endothelial growth factor receptor-1/soluble vascular endothelial growth factor receptor-1 overexpression in the placenta strongly correlates with both severity of hypertensive disease and villous hypermaturity. The correlation with villous

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